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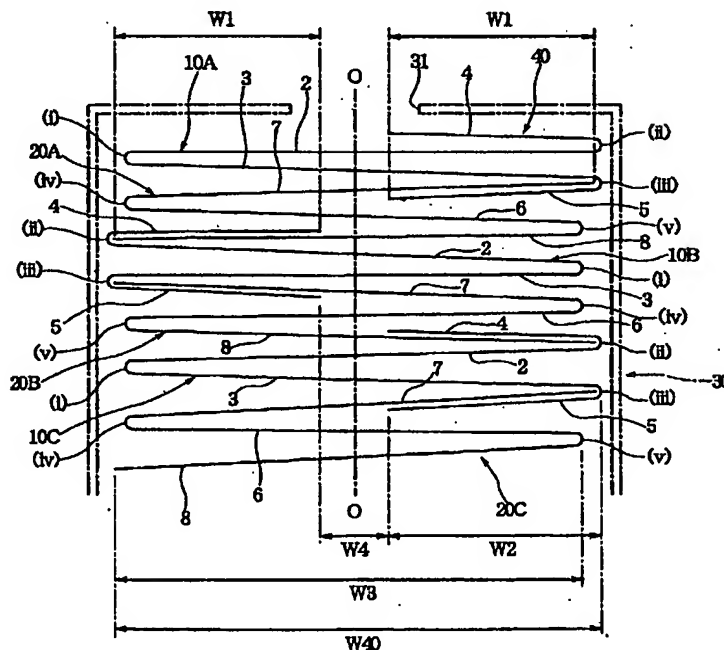
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(54) **Sheet package**

(57) Provided is a sheet package including a stack of sheets having a plurality of folded sheets and a receptacle for packaging the stack of sheets. The stack of sheets includes first folded sheets and second folded sheets. The first folded sheets and the second folded sheets are alternately stacked in such a manner that the

bottom flap portion of the first folded sheet is interfolded with the top flap portion of the second folded sheet, and one pair of the first and second folded sheets and the other pair of the first and second folded sheets next to one pair are so arranged as to interfold the bottom flap portion of the second folded sheet of one pair with the top flap portion of the first folded sheet of the other pair.

Fig. 1



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a sheet package, in which a stack of folded sheets is packaged in a receptacle or a container having a dispensing opening in such a manner as to continuously dispense the sheets.

Description of the Related Art

[0002] Wet sheets are used for cleaning hands, for wiping babies' crotches or for wiping or cleaning toilets or kitchens. In order to maintain the sheets in a wet state, the wet sheets are airtightly packaged in a receptacle such as a hard container or a bag made of a package sheet. In this receptacle, there is formed a dispensing opening for allowing the sheets to be sequentially taken out. The wet sheets of this type are stacked vertically one on top of the other in an interfolded manner. Accordingly, when an overlying sheet is withdrawn through the dispensing opening of the container, an underlying sheet is lifted and drawn to protrude an underlying sheet properly from the dispensing opening.

[0003] For the so-called "pop-up" type sheet package of this kind, it is desirable to make the stack of sheets compact by folding the individual sheets as small as possible, and to present an upper portion of an underlying sheet in a readily accessible location above the dispensing opening, when an overlying sheet is taken out of the dispensing opening. Specifically, by making the stack of sheets compact, the sheet package is superior to portability or can be disposed in a small place. On the other hand, by optimizing the protrusion of the sheet (i.e., the exposed portion of the sheet) from the dispensing opening, it is possible to prevent the exposed portion of the sheet from being excessively dry.

[0004] Fig. 4 is a sectional view showing the conventional sheet package of which objects are to make the stack of sheets compact and optimize the protrusion of the sheet from the dispensing opening, as set forth above.

[0005] In the sheet package shown in Fig. 4, a plurality of folded sheets 40 are stacked vertically one on top of the other in an interfolded manner, and then the stack of sheets is packaged in a receptacle or container 50. A dispensing opening 51 is formed in a central portion of a top surface of the receptacle 50.

[0006] Each of these sheets 40 is folded into a Z-folded configuration to define a top flap portion 41 folded upward upon a central portion 43, and a bottom flap portion 42 folded downward under the central portion 43. The sheet 40 is folded in three to reduce the folded area thereof. In this stack of folded sheets, the top flap portion 41 of the underlying sheet lies between the central por-

tion 43 and the bottom flap portion 42 of the overlying sheet so the bottom flap portion 42 of the overlying sheet and the top flap portion 41 of the underlying sheet overlap via an overlap portion of a width W_a .

[0007] When the top flap portion 41 of the overlying sheet is pulled out of the dispensing opening 51, the top flap portion 41 of the underlying sheet is dragged along with the bottom flap portion 42 of the overlying sheet and then a portion of the underlying sheet is exposed from the dispensing opening 51. When the overlying sheet is withdrawn from the dispensing opening 51, the underlying sheet is subjected to a resistance by the periphery of the dispensing opening 51 so that the overlying and underlying sheets are separated from each other. As a result, the underlying sheet is left in the receptacle 50 with the top flap portion 41 thereof protruding from the dispensing opening 51. Therefore, the sheet can be pulled out by pinching (grasping) the top flap portion 41 protruding from the dispensing opening 51.

[0008] In the case of wet sheets, the width W_a of the overlap portions of the overlying and underlying sheets is preferably about 20 to 40 mm and is most preferably about 30 mm. In the case where the width W_a is within the defined range, the underlying sheet reliably follows the overlying sheet when the overlying sheet is taken out, and the top flap portion 41 of the underlying sheet protrudes a proper length from the dispensing opening 51 (i.e., the top flap portion 41 is partly exposed in a readily accessible location above the dispensing opening).

[0009] In order to fold the individual sheets 40 into a Z-folded configuration as shown in Fig. 4 and define the width W_a of the overlap portions to be about 30 mm, the top flap portion 41 and the bottom flap portion 42 are joined in the vicinity of a center line O - O. Specifically, when the overlying and underlying sheets 40 are combined (or interfolded), it is necessary to set a combined width W_b of the individual sheets 40 so that the top flap portion 41 and the bottom flap portion 42 can overlap with the width of 30 mm in the vicinity of the center line O - O.

[0010] In such a sheet combination, however, the number of overlaps of the sheets (i.e., the number of sheet layers) located in the vicinity of the center line O - O of the stack of sheets is larger than the number of overlaps of the sheets (i.e., the number of sheet layers) located on both sides of the stack of sheets. Such alignment of the folded sheets undesirably results in a ridge (or a protrusion) formed in the vicinity of the center line O - O of the stack of sheets due to the material thickness differences in the stack. Namely, the ridge results in a stack of sheets which has a nonplanar top surface. Furthermore, the ridge increases the height of the entire sheet package.

SUMMARY OF THE INVENTION

[0011] The present invention has been worked out in

view of the shortcoming in the prior art set forth above. It is therefore an object of the present invention to provide a compact sheet package in which the width (as-folded width) of a stack of sheets is reduced and the width of an overlap portion of interfolded sheets is made equal.

[0012] According to an aspect of the present invention, a sheet package may comprise:

a stack of sheets including a plurality of folded sheets arranged in a vertically stacked configuration;

a receptacle for packaging the stack of sheets, the receptacle made of hard or soft material and having a dispensing opening in a top surface thereof;

the stack of sheets including first folded sheets and second folded sheets, each of the first folded sheets having upper and lower central portions folded into two about a first fold line, a top flap portion folded about a second fold line upon the upper central portion, and a bottom flap portion folded about a third fold line under the lower central portion, each of the second folded sheets having a central portion, a top flap portion folded about a fourth fold line upon the central portion, and a bottom flap portion folded about a fifth fold line under the central portion;

wherein the first folded sheets and the second folded sheets are alternately stacked in such a manner that the bottom flap portion of the first folded sheet is interfolded with the top flap portion of the second folded sheet, and one pair of the first and second folded sheets and the other pair of the first and second folded sheets next to one pair are so arranged as to interfold the bottom flap portion of the second folded sheet of one pair with the top flap portion of the first folded sheet of the other pair; and

wherein each of the folded sheets are interfolded so that the top flap portion of each second folded sheet lies between the lower central portion and the bottom flap portion of overlying first folded sheet, and so that the bottom flap portion of each second folded sheet lies between the upper central portion and the top flap portion of underlying second folded sheet.

[0013] In the construction set forth above, it is preferred that the first fold line of each first folded sheet is located at a position to divide a length of an unfolded sheet into two equal parts so that the upper and lower central portions have substantially equal areas.

[0014] On the other hand, it is preferred that the top and bottom flap portions of each first folded sheet have a length one half or less of that of the top and bottom flap portions of each second folded sheet.

[0015] For example, an overlap portion between the top flap portion of each second folded sheet and the bottom flap portion of each first folded sheet, and an overlap portion between the bottom flap portion of each second folded sheet and the top flap portion of each first folded

sheet, are symmetrically arranged about a center line O - O of the stack of sheets.

[0016] In this case, it is preferred that the individual sheets of the first folded sheets are interfolded so that the top flap portion and the bottom flap portion of each odd-numbered sheet and the top flap portion and the bottom flap portion of each even-numbered sheet are prevented from mutually overlapping on the center line O - O.

[0017] Furthermore, it is preferred that one of the first folded sheets is located at an uppermost position within the receptacle.

[0018] With the present invention, the first folded sheets and the second folded sheets can be made compact to obtain a compact stack of sheets. Furthermore, the overlap portions between the overlying folded sheets and the underlying folded sheets can be symmetrically arranged about the center line O - O of the stack of sheets. Accordingly, it is possible to prevent the stack of sheets from being partly thick, and provide a stack of folded sheets having a planar top surface without any ridge. In other words, there is equal overlap for all sheets.

[0019] According to another aspect of the present invention, a sheet package may comprise:

a stack of sheets including a plurality of folded sheets arranged in a vertically stacked configuration;

a receptacle for packaging the stack of sheets, the receptacle made of hard or soft material and having a dispensing opening in a top surface thereof, the stack of sheets including:

a first W-folded sheet including essentially V-shaped first central portion, a first top flap portion extending from upper end of the first central portion in a first direction and a first bottom portion extending from a lower end of the first central portion in the first direction;

a second reversed Z-folded sheet including a substantially straight second central portion, a second top flap portion extending from an upper end of the second central portion in a second direction opposite to the first direction and a second bottom flap portion extending from a lower end of the second central portion in the first direction, the second top flap portion overlapping with the first bottom flap of the first W-folded sheet for interlinking the first W-folded sheet and the second reversed Z-folded sheet so that the second top flap portion is at least partly pulled out of the receptacle through the dispensing opening when the first W-folded sheet is dispensed;

a third reversed W-folded sheet including essentially V-shaped third central portion, a third top flap portion extending from an upper end of

the third central portion in the second direction and a third bottom flap portion extending from a lower end of the third central portion in the second direction, the third top flap portion overlapping with the second bottom flap portion of the second reversed Z-folded sheet for interlinking the second reversed Z-folded sheet and the third reversed W-folded sheet so that the third top flap portion is at least partly pulled out of the receptacle through the dispensing opening when the second reversed Z-folded sheet is dispensed; and

a fourth Z-folded sheet including a substantially straight fourth central portion, a fourth top flap portion extending from an upper end of the fourth central portion in the first direction and a fourth bottom flap portion extending from a lower end of the fourth central portion in the second direction, the fourth top flap portion overlapping with the third bottom flap portion of the third reversed W-folded sheet for interlinking the third reversed W-folded sheet and the fourth Z-folded sheet so that the fourth top flap portion is at least partly pulled out of the receptacle through the dispensing opening when the third reversed W-folded sheet is dispensed;

the first W-folded sheet, the second reversed Z-folded sheet, the third reversed W-folded sheet and the fourth Z-folded sheet forming a series; and

the fourth bottom flap portion of one series overlapping with first top flap portion of the first W-folded sheet of next series for interlinking a plurality of series.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The present invention will be understood more fully from the detailed description given hereinafter and from the accompanying drawings of the preferred embodiment of the present invention, which, however, should not be taken to be limitative to the invention, but are for explanation and understanding only.

[0021] In the drawings:

Fig. 1 is a sectional view showing a sheet package according to the present invention;

Figs. 2A, 2B and 2C are perspective views for explaining how to form a first folded sheet composing the sheet package according to the present invention;

Figs. 3A and 3B are perspective views for explaining how to form a second folded sheet composing the sheet package according to the present invention; and

Fig. 4 is a sectional view showing the conventional sheet package.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0022] The present invention will be discussed hereinafter in detail in terms of the preferred embodiment according to the present invention with reference to the accompanying drawings. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to those skilled in the art that the present invention may be practiced without these specific details. In other instance, well-known structure are not shown in detail in order to avoid unnecessary obscurity of the present invention.

[0023] Fig. 1 is a sectional view showing a sheet package of the invention; Figs. 2A, 2B and 2C are perspective views for explaining how to form a first folded sheet of the sheet package; and Figs. 3A and 3B are perspective views for explaining how to form a second folded sheet of the sheet package.

[0024] Firstly, a sheet package of Fig. 1 will be described in detail. A stack of sheets 40 is packaged in a receptacle or container 30 to form the sheet package. This receptacle 30 may be a hard container formed of a plastic material or a package bag formed of a soft packaging sheet such as a laminate of a resin film and an aluminum foil. Alternatively, the package bag in which the stack of sheets 40 is packaged, may be packaged in the hard container for use. A dispensing opening 31 is formed in a top surface of the receptacle 30.

[0025] In the stack of sheets 40, first folded sheets 10 and second folded sheets 20 are alternately stacked. In Fig. 1, the first, second and third ones of the first folded sheets 10 to be stacked in a sequential order are designated by the reference numerals 10A, 10B and 10C. Similarly, the first, second and third ones of the second folded sheets 20 to be stacked in a sequential order are designated by the reference numerals 20A, 20B and 20C.

[0026] As shown in Figs. 2 and 3, a sheet 1 having an identical size in an expanded state ("a sheet 1" is also referred to as an unfolded sheet 1, hereinafter) is folded to form the first folded sheet 10 and the second folded sheet 20, respectively. The unfolded sheet 1 is rectangular (or square), and has a long side 1a (or one side 1a in the case where the sheet 1 is square) of a length or an unfolded length W0 of 190 mm, for example.

[0027] Fig. 2 shows how to fold the sheet to form the individual first W-folded sheets 10. Firstly, the sheet 1 is folded into two about a fold line (i) or a first fold line which is parallel to a short side 1b and halves the long side 1a to define an upper central portion 2 and a lower central portion 3 as shown in Fig. 2B. Then, the upper central portion 2 is folded upward about a fold line (ii) or a second fold line parallel to the fold line (i) to define a top flap portion 4, and the lower central portion 3 is folded downward about a fold line (iii) or a third fold line parallel to the fold line (i) to define a bottom flap portion 5 as shown in Fig. 2C. In other words, the first folded sheet

10 comprises the upper central portion 2, the lower central portion 3, the top flap portion 4 and the bottom flap portion 5. It should be noted that the upper central portion 2 and the lower central portion 3 have equal areas.

[0028] Fig. 3 shows how to fold the sheet to form the individual second Z-folded sheets 20. Firstly, the sheet 1 is folded about a fold line (iv) or a fourth fold line which is parallel to the short side 1b and divides the long side 1a into three equal parts to define a top flap portion 7 upon a central portion 6, and then folded about a fold line (v) or a fifth fold line which is also parallel to the short side 1b and divides the long side 1a into three equal parts to define a bottom flap portion 8 under the central portion 6, as shown in Fig. 3B. In other words, the second folded sheet 20 comprises the top flap portion 7, the central portion 6 and the bottom flap portion 8.

[0029] As shown in Fig. 1, the stack of sheets 40 includes a first W-folded sheet 10A; a second reversed Z-folded sheet 20A; a third reversed W-folded sheet 10B; and a fourth Z-folded sheet 20B. Specifically, there are alternately stacked the first folded sheets 10 (10A, 10B, 10C, - - -, and so on) and the second folded sheets 20 (20A, 20B, 20C, - - -, and so on) in such a manner that the bottom flap portion of the first folded sheet are interfolded with the top flap portion of the second folded sheet, and one pair of the first and second folded sheets and the other pair of the first and second folded sheets next to one pair are so arranged as to interfold the bottom flap portion of the second folded sheet of one pair with the top flap portion of the first folded sheet of the other pair. In other words, the fold lines (i), (ii) and (iii) are positioned on the opposed right and left sides of the stack of sheets. The fold lines (iv) and (v) are also positioned on the opposed right and left sides of the stack of sheets.

[0030] The top flap portion 7 of the underlying second folded sheet 20 lies between the lower central portion 3 and the bottom flap portion 5 of the overlying first folded sheet 10. On the other hand, the bottom flap portion 8 of the overlying second folded sheet 20 lies between the upper central portion 2 and the top flap portion 4 of the underlying first folded sheet 10. As shown in Fig. 1, both the overlap portion of the bottom flap portion 5 of the first folded sheet 10 and the top flap portion 7 of the second folded sheet 20 and the overlap portion of the top flap portion 4 of the first folded sheet 10 and the bottom flap portion 8 of the second folded sheet 20 have a width W1.

[0031] In the case where each sheet 1 is in a wet state (i.e., a wet sheet), the width W1 of the overlap portions is set to have a preferable range of 20 to 40 mm and the most preferable value of about 30 mm. If the width W1 is within the defined range, the underlying sheet is dragged along with the overlying sheet when the overlying sheet is withdrawn from the dispensing opening 31, and then the underlying sheet is partly exposed from the dispensing opening 31. Specifically, when the overlying sheet is withdrawn from the dispensing opening

31, the underlying sheet is subjected to a resistance by the periphery of the dispensing opening 31 to separate the overlying and underlying sheets from each other to present the upper portion of the underlying sheet in a readily accessible location above the dispensing opening.

[0032] In the stack of sheets 40 shown in Fig. 1, the width W2 of the top flap portion 4 and the bottom flap portion 5 of the first folded sheet 10 is one half or less of the width W3 of the top flap portion 7 and the bottom flap portion 8 of the second folded sheet 20. Furthermore, the top flap portion 4 and the bottom flap portion 5 of the first folded sheets 10A, 10C, - - - (i.e., odd-numbered folded sheets) and the top flap portion 4 and the bottom flap portion 5 of the first folded sheets 10B, - - - (i.e., even-numbered folded sheets), are symmetrically arranged about the center line O - O of the stack of sheets to prevent from overlapping each other on the center line O - O. In short, mutually opposing end edges of the top flap portions 4 and the bottom flap portions 5 are spaced from each other about the center line O - O by a spacing W4. As a result, the overlap portions of the width W1 are also symmetrically arranged about the center line O - O so that they do not overlap each other.

[0033] Accordingly, it is possible to prevent the number of overlaps of the sheets (i.e., the number of sheet layers) from increasing in the vicinity of the center line O - O to increase locally the height of sheet package, and to provide a stack of sheets having a planar top surface.

[0034] On the other hand, the individual first folded sheets 10 are folded about three fold lines (i), (ii) and (iii), and the individual second folded sheets 20 are also folded about two fold lines (iv) and (v). Accordingly, the folded sheets 10 and 20 can be made so compact that the width (as-folded width) of the stack of sheets 40 is reduced, thereby obtaining a compact stack of sheets.

[0035] If the long side 1a of the unfolded (or expanded) sheets 1 as shown in Figs. 2A and 3A has the length W0 of 190 mm, for example, the first and second folded sheets 10 and 20 are given the following sizes. In the first folded sheet 10, the top flap portion 4 and the bottom flap portion 5 have the width W2 of 30 mm which is equal to the width W1 of the overlap portions, and the upper and lower central portions 2, 3 have a length of 65 mm. On the other hand, in the second folded sheet 20, the top flap portion 7 and the bottom flap portion 8 have the width W3 of 65 mm, and the central portion 6 has a length of 60 mm. As a result, the width W40 of the stack of sheets 40 is 70 mm, and the spacing W4 is 10 mm.

[0036] The sheets 1 include spun-laced nonwoven fabric formed of synthetic fibers of PE, PP or PET or composite synthetic fibers of PP/PET or PE/PET; spun-laced nonwoven fabric formed of the synthetic fibers or the composite synthetic fibers and regenerated cellulose fibers of rayon; or a laminate sheet formed of the nonwoven fabric and a synthetic resin film. The sheets 1 thus made are packaged in the receptacle 30 in the

wet state impregnated with water or chemicals.

[0037] Alternatively, the sheets 1 may be in a dry state. The sheets 1 may also be wet water-decomposable sheets or dry water-decomposable sheets.

[0038] The sheets may be water-decomposable (or degradable) sheets of which the fibers are broken and dispersed in water when they are, after used, disposed of in flush toilets and have received a large amount of water therein. For example, they include paper or nonwoven fabrics made of fibers such as rayon or pulp and containing a water-degradable or water-swellaible binder such as CMC (carboxymethyl cellulose); nonwoven fabrics of rayon fibers or the like having a fiber length of at most 10 mm or at most 7 mm and having been subjected to water-jetting treatment for entangling the fibers, of which the entangled fibers having such a short length of at most 10 mm are, when having received a large amount of water, unentangled and degraded in water; and paper or nonwoven fabrics of rayon or pulp that contains fibrillated rayon, in which the fibrillated rayon serves as a binder.

[0039] As shown in Fig. 1, the individual sheets are so interfolded that the top flap portions 4 and the bottom flap portions 5 of the first folded sheets 10 to be symmetrically located about the center line O - O are prevented from mutually overlapping on the center line O - O. Alternatively, in the stack of sheets 40, the top flap portion 4 and the bottom flap portion 5 located on the right-hand side of the stack about the center line O - O and the top flap portion 4 and the bottom flap portion 5 located on the left-hand side of the stack about the center line O - O may overlap partly each other on the center line O - O.

[0040] As set forth above, with the structure of the sheet package according to the invention, the individual sheets can be folded in compact to have a small width (as-folded width). Furthermore, there is equal overlap for all sheets to prevent from forming the local ridge (or protrusion) of the stack of sheets and the like, thereby providing a stack of sheets having a planar top surface without any ridge. On the other hand, it is also possible to define the overlap portions having the optimum overlapping sizes to provide improved dispensability of the folded sheets.

[0041] Although the present invention has been illustrated and described with respect to exemplary embodiment thereof, it should be understood by those skilled in the art that the foregoing and various other changes, omission and additions may be made therein and thereto, without departing from the spirit and scope of the present invention. Therefore, the present invention should not be understood as limited to the specific embodiment set out above but to include all possible embodiments which can be embodied within a scope encompassed and equivalent thereof with respect to the feature set out in the appended claims.

Claims

1. A sheet package comprising:

a stack of sheets including a plurality of folded sheets arranged in a vertically stacked configuration;
a receptacle for packaging said stack of sheets, said receptacle made of hard or soft material and having a dispensing opening in a top surface thereof;
said stack of sheets including first folded sheets and second folded sheets, each of said first folded sheets having upper and lower central portions folded into two about a first fold line, a top flap portion folded about a second fold line upon said upper central portion, and a bottom flap portion folded about a third fold line under said lower central portion, each of said second folded sheets having a central portion, a top flap portion folded about a fourth fold line upon said central portion, and a bottom flap portion folded about a fifth fold line under said central portion;

wherein said first folded sheets and said second folded sheets are alternately stacked in such a manner that said bottom flap portion of said first folded sheet is interfolded with said top flap portion of said second folded sheet, and one pair of said first and second folded sheets and the other pair of said first and second folded sheets next to said one pair are so arranged as to interfold said bottom flap portion of said second folded sheet of said one pair with said top flap portion of said first folded sheet of said the other pair; and

wherein each of said folded sheets are interfolded so that said top flap portion of each second folded sheet lies between said lower central portion and said bottom flap portion of overlying first folded sheet, and so that said bottom flap portion of each second folded sheet lies between said upper central portion and said top flap portion of underlying second folded sheet.

2. The sheet package as set forth in claim 1,

wherein the first fold line of each first folded sheet is located at a position to divide a length of an unfolded sheet into two equal parts so that said upper and lower central portions have substantially equal areas.

3. A sheet package as set forth in claim 1,

wherein said top flap portion and said bottom flap portion of each first folded sheet have a length one half or less of that of said top flap portion and said bottom flap portion of each second folded sheet.

4. A sheet package as set forth in claim 1,
 wherein an overlap portion between said top
 flap portion of each second folded sheet and said
 bottom flap portion of each first folded sheet, and
 an overlap portion between said bottom flap portion
 of each second folded sheet and said top flap por-
 tion of each first folded sheet, are symmetrically ar-
 ranged about a center line O - O of said stack of
 sheets. 5
5. A sheet package as set forth in claim 1,
 wherein the individual sheets of said first fold-
 ed sheets are interfolded so that said top flap por-
 tion and said bottom flap portion of each odd-num-
 bered sheet and said top flap portion and said bot-
 tom flap portion of each even-numbered sheet are
 prevented from mutually overlapping on the center
 line O - O. 10 15
6. A sheet package as set forth in claim 1,
 wherein one of said first folded sheets is lo-
 cated at an uppermost position within said recepta-
 cle. 20
7. A sheet package comprising: 25
 - a stack of sheets including a plurality of folded
 sheets arranged in a vertically stacked config-
 uration; 30
 - a receptacle for packaging said stack of sheets,
 said receptacle made of hard or soft material
 and having a dispensing opening in a top sur-
 face thereof, said stack of sheets including;
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 least partly pulled out of said receptacle
 through said dispensing opening when said first
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 said first W-folded sheet, said second reversed
 Z-folded sheet, said third reversed W-folded
 sheet and said fourth Z-folded sheet forming a
 series; and
 said fourth bottom flap portion of one series
 overlapping with said first top flap portion of
 said first W-folded sheet of next series for inter-
 linking a plurality of series. 50 55

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 said fourth bottom flap portion of one series
 overlapping with said first top flap portion of
 said first W-folded sheet of next series for inter-
 linking a plurality of series.

Fig. 1

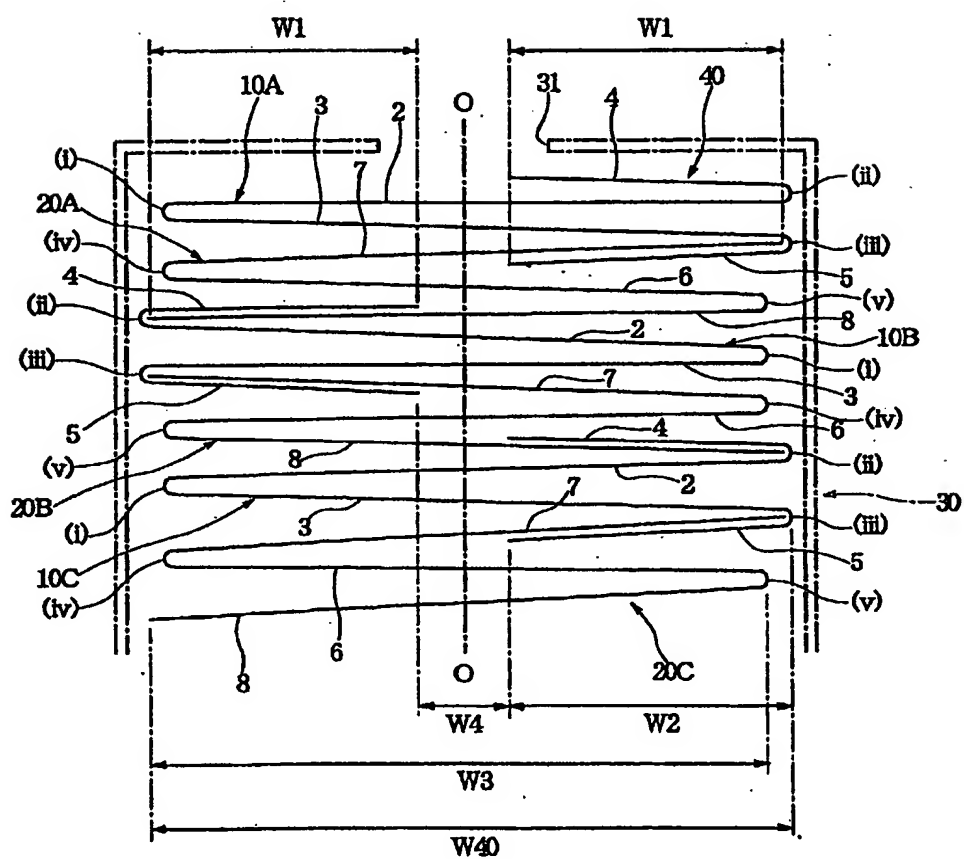


Fig. 2A

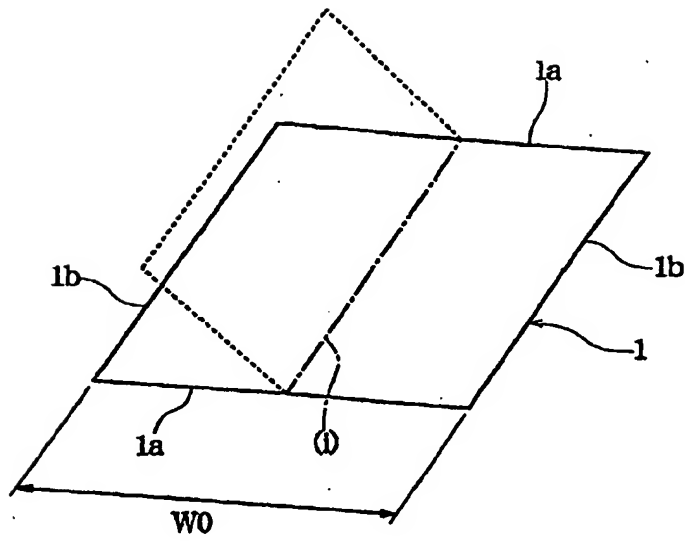


Fig. 2B

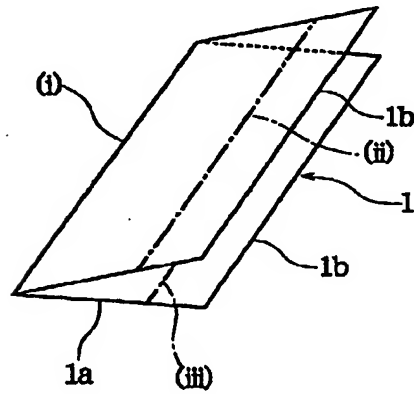


Fig. 2C

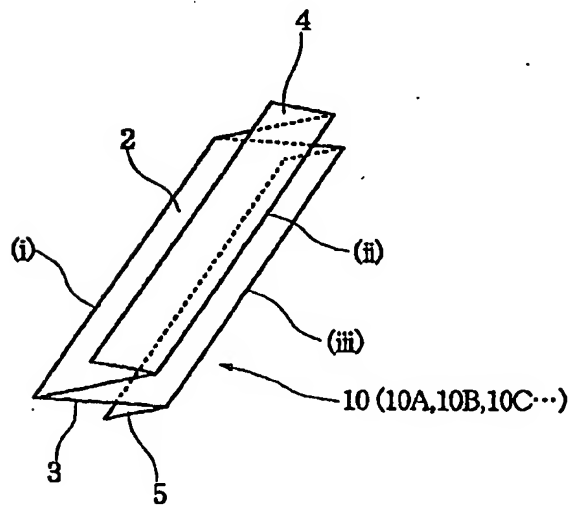


Fig. 3A

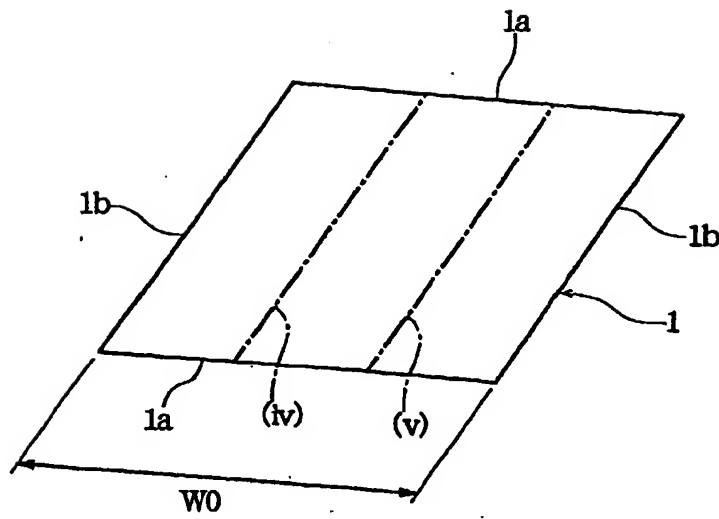


Fig. 3B

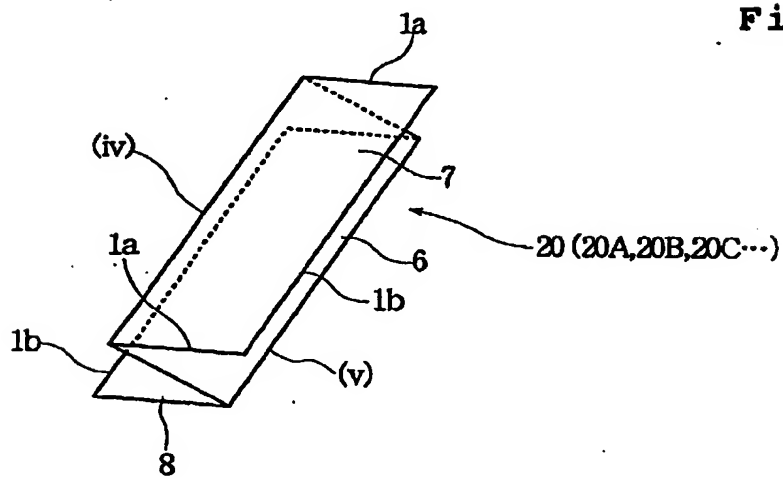
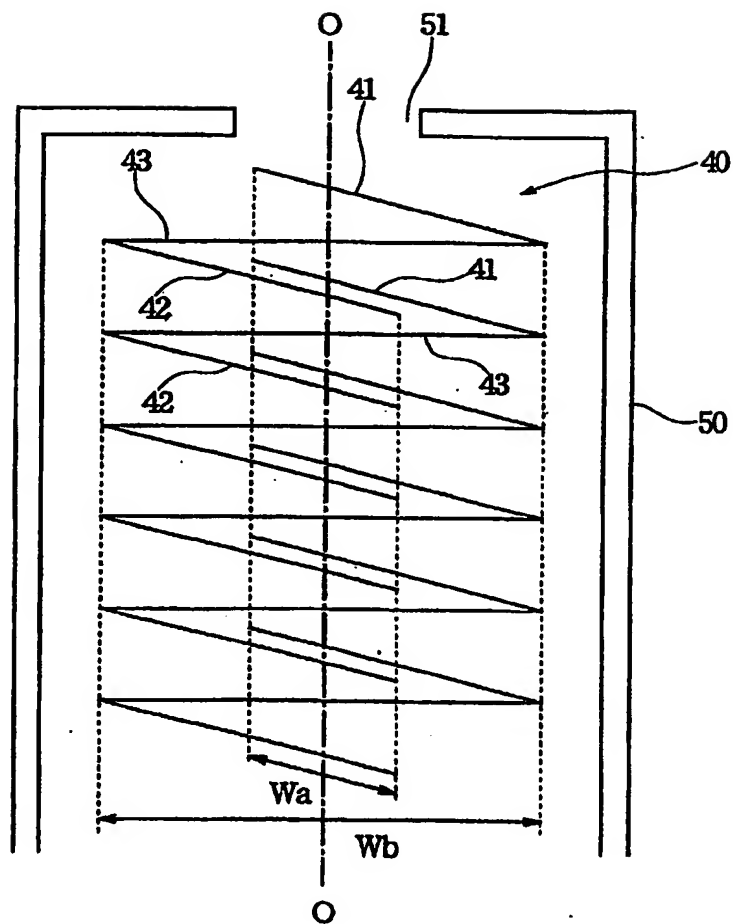


Fig. 4





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 30 9775

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			A47K
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Place of search THE HAGUE		Date of completion of the search 18 January 2002	Examiner Delzor, F
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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